

REMARKS

The present invention claims a combination camera and loudspeaker that comprises a lens and a loudspeaker assembly disposed proximate the lens. The loudspeaker assembly includes a speaker coil disposed around at least a portion of the lens' outer perimeter and a transparent diaphragm connected to the speaker coil and aligned with at least a portion of the lens. The transparent diaphragm projects audible sound according to audio signals provided to the speaker coil. Optical properties of the camera, e.g., the focal length of the camera, may be manipulated by controlling a radius of curvature and/or a location of the transparent diaphragm relative to the lens.

The examiner rejects claims 1 – 32 as obvious under §103 over Allan (GB2376592) in view of Saiki (US7050600). Allan describes a camera/speaker assembly that mounts a camera lens (3, 20) over a light sensing array (24) and onto an actuator (7, 22) using a mounting (6, 21) (see Figures 2 and 3 and pages 5 and 6). The actuator may vertically displace the lens according to electrical signals provided to the actuator. When the electrical signals comprise camera focus signals, the movement of the actuator adjusts the focus of the lens. However, when the electrical signals comprise audio signals, the movement of the actuator causes the mounting and the lens to vibrate, which radiates sound similar to a conventional loudspeaker.

Saiki describes an speaker/display assembly for a mobile device that combines a speaker system (1000, see Figures 1A, 1B, and 2) with a display (21) to enable the mobile device to display images from the same position from which sound is output. The speaker system includes a transparent panel (24) and a transducer (22) including a diaphragm (45) controlled by a voice coil (44). When the voice coil vibrates the diaphragm, sound waves travel from the diaphragm through a hole 23 into a space (26) beneath the transparent panel and above the display. The sound waves in the space vibrate the transparent panel to generate sound.

While the Examiner concedes that Allan does not teach the transparent diaphragm or the speaker coil of independent claim 1, the Examiner asserts that Saiki teaches the missing elements. However, the teachings of Allan and Saiki are unrelated. Allan relates to a camera/speaker assembly, while Saiki relates to a speaker/display assembly, where Saiki's speaker/display assembly is independent of any type of camera apparatus. As such, it is unclear why the skilled user would be motivated to combine the camera/speaker assembly of Allan with the speaker/display assembly of Saiki.

Further, it is unclear how the skilled user could combine Allan with Saiki without adversely affecting the operation of one or both devices. First, while the diaphragm of Saiki may be transparent, the mechanical housing structure required to make Saiki's speaker operate is not transparent. Thus, regardless of how the speaker/display system of Saiki is inserted into the camera/speaker of Allan, Saiki's housing structure will block light associated with the Allan's lens from the light sensing array. Thus, combining Saiki with Allan renders Allan inoperative.

Second, Saiki relies heavily on the space between the display and transparent panel to accurately transfer sound waves from the transducer to the transparent panel. Col. 8, line 65 to col. 9, line 12 in Saiki describes how the width of the space affects the acoustic capacitance of the space, and therefore, affects the frequency range of the output sound. It is unclear how the skilled user could combine the mechanical arrangement of the speaker/display of Saiki (see Figure 1B) with the mechanical arrangement of the camera/speaker of Allan (see Figure 3) without compromising the sound transfer properties of the space.

For at least these reasons, there is no motivation to combine Saiki with Allan. The applicants therefore respectfully request that the examiner reconsider all rejections.

The applicants further note that the combination of Allan with Saiki does not teach or suggest at least the limitations of claims 2 – 4, 10 – 12, 14, 17, 18, and 29 – 31. As amended, claims 2, 10, 14, and 29 claim selectively controlling optical properties of the transparent diaphragm to selectively set a focal length of the camera. Further, amended claims 4, 12, 18, and 31 claim selectively setting the focal length of the camera by modifying a radius of curvature of the transparent diaphragm. Contrary to the examiner's assertions, controlling the vibration of a speaker diaphragm does not control the focal length of a camera. Thus, at least claims 2, 4, 10, 12, 14, 18, 29, and 31 add patentably distinct limitations to their respective independent claims.

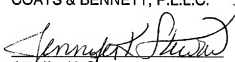
As amended, claims 3, 11, 17, and 30 claim selectively varying a distance between the transparent diaphragm and the lens. The examiner takes official notice that it is known to use an electric motor to selectively move a lens in a camera. However, the claims require varying a distance between a speaker diaphragm and a camera lens. As there is no evidence that it is known to selectively move a speaker diaphragm relative to a camera lens to control a focal length of the camera, claims 3, 11, 17, and 30 add patentably distinct limitations to their respective independent claims. Should the examiner insist on this line of reasoning, the applicants respectfully request that the examiner provide concrete evidence of prior art that teaches moving a speaker diaphragm relative to a camera lens to control a focal length of the camera. Without such evidence, the rejection is insufficient and must be withdrawn.

Lastly, the examiner objects to claims 5, 13, 19, and 32 for misspelling polyethylene. In response, the applicants amend claims 5, 13, 19, and 32, and the paragraph beginning on page 7, line 11. No new matter is added.

In light of the above remarks and the enclosed claim amendments, claims 1 – 32 stand in condition for allowance. Should any issues remain, the applicants request that the examiner call the undersigned so that any such issues may be expeditiously resolved.

Respectfully submitted,

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